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TWO NEW TRUFFLES

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Tuber canaliculatum sp. nov.

Tuber Borchii Kauffman non Vittad. Rep. Mich. Acad. Sci. 12: 216. 1910.

Ascocarp brown, surface conspicuously covered with small, low, polygonal papillae; veins conspicuous, whitish; cortex pseudoparenchymatous with outermost cells sometimes arranged in hyphae more or less parallel with surface of ascocarp, sometimes projecting beyond surface as hairs; pseudoparenchymatous layer changing to somewhat irregularly arranged coalescent hyphae, becoming less connected toward hymenium; thickness of peridium 360–520 μ ; venae internae small and inconspicuous to almost wanting, consisting of unconnected somewhat irregularly arranged hyphae, latter 4–6 μ in diam.; tissue between asci of similar structure, but hyphae bordering venae externae becoming distinctly parallel, some ending at margin of vein as more or less regularly arranged, somewhat swollen-tipped paraphyses, others continuing inward to form loose, interwoven tissue filling venae externae; latter much enlarged in places, and hyphal tissue of narrower portions often breaking away, leaving empty channels through ascocarp; asci short-stipitate, semiglobose to cylindric, 72–88 by 96–120 μ , 1-, 2-, or 3- (generally 2-) spored; spores dark-brown, ellipsoid to nearly globose, 40–52 by 48–72 μ , alveolate, 4 by 5 to 7 by 8 alveoli across diameters; sculpturing 4–6 μ thick.

On sandy hillside of maple, oak, and hemlock, bordering a cedar swamp. Allegan Co., Mich., Sept. 15. No. 339, U. C. Coll. Mrs. C. H. Kauffman.

This species, which was sent to the University of California herbarium by Professor C. H. Kauffman of the University of Michigan, was published under the name of *T. Borchii* in the 12th Report of the Michigan Academy of Sciences, 1910. The material examined, however, does not have the smooth surface of the latter as described by Vittadini (Mon. Tub., 1831) who

established the species, or by Ed. Fischer (Tuberaceen und Hemiasceen in Rabenhorst, Kryptogamen-Flora von Deutschland. V Abtheilung, 1897); the asci and spores are larger (the measurements for *T. Borchii* given by Fischer being 60–80 by 60–100 μ for asci, and 24–35 by 28–49 μ for spores). The latter measurements made without the sculpturing, may be compared with 28–40 by 36–60 μ , the measurements of the Michigan material made in the same manner. In descriptions of *T. Borchii* no mention is made of the distinguishing characters of the Michigan specimens, *i.e.*, the absence of or very small venae internae, the exceedingly large venae externae sometimes becoming hollow, and the distinct palisade-like hyphae bordering the latter veins. The spore measurements of *T. macrosporum*, given by Fischer are comparable to those of this species (28–45 by 38–80), and the surface of the ascocarp is described as having “kleinen, abgeflacht pyramidenförmigen Warzen oder polygonalen Feldern,” but here, also, paraphyses and the peculiar nature of the venae externae are not mentioned, while the reticulation of the spore surface is described—also figured by Tulasne (Fungi Hypogaei, 1851)—as very close, 10 by 15 alveoli occurring across diameters in Tulasne’s illustration. The figure and descriptions represent the spore,

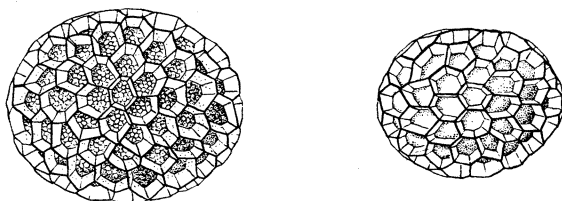


FIG. 1. Spores of the two species described. On the left, one of *Tuber canaliculatum* $\times 385$. On the right, of *Tuber unicolor* $\times 625$.

too, as much longer in comparison to its short diameter than that of the Michigan species.

***Tuber unicolor* sp. nov.**

Ascocarp yellow-brown, 1–2 cm. in diam., somewhat convolute to sometimes deeply furrowed; surface very minutely scabrous; gleba yellowish with slender white veins; outer cortical tissue

coarsely pseudoparenchymatous, breaking away more or less at surface, changing within to irregular open tissue consisting of pseudoparenchyma and hyphae; sub-cortex of similar structure but more compact, and forming origin of venae internae; thickness of peridium 400–600 μ ; venae internae similar in structure to sub-cortex, hyphae 4–6 μ in diam.; venae externae conspicuous, long, branching, generally twice the diam. of venae internae, similar in structure to inner cortical layer, hyphae 6 μ in diam.; asci semi-globose, 48–56 by 56–64 μ , 1–4-spored; spores yellow, globose-ellipsoid, 20–38 by 22–40 μ , alveolate, 3 by 4 to 6 by 7 alveoli across diameters, sculpturing 4–5 μ thick.

Beneath the surface of the ground, near oaks. No. 530, U. C. Coll., *L. Robba & G. Giavelli*.

Material of this species was received from Dr. Fred J. Seaver, of the New York Botanical Garden, and later from Mrs. Flora Patterson, of Washington, D. C., the material in both cases, however, having been collected near New York City by L. Robba and G. Giavelli.

Of the European species of *Tuber* described, this apparently comes nearest *T. dryophilum*, *T. maculatum*, and *T. rapaeodorum*, principally in the general characters of ascocarp surface and of spore. However, the specimens of this species examined differ from descriptions of all three in the uniform color of the ascocarp, that of the three European species mentioned being described as mottled or spotted. The unusually thick cortex and the 1–4-spored asci also distinguish our species from *T. dryophilum* as described. In gleba color and number of spores in the ascus, it differs from descriptions of *T. maculatum*; and from *T. rapaeodorum* in the usual spore number in the ascus, in the shape of the spores (the measurements cited for the spores of the latter, i.e. 29–42 by 23–29 μ , making them less nearly globose), and in the characteristic structure of the cortex described above, that of the European species as figured by Tulasne (Fung. Hyph., pl 18, fig. 1), having a distinctly pseudoparenchymatous structure without, and hyphal structure within. It is thought best to consider this, therefore, a distinct species.